6-8-2021

Digital Library Readiness of Distance Learners: The Access and Skills Imperative

CHRISTOPHER M. OWUSU-ANSAH
chrisoansah@gmail.com

DIGITAL LIBRARY READINESS OF DISTANCE LEARNERS: THE ACCESS AND SKILLS IMPERATIVE

Abstract

Digital libraries play an integral role in the success of any distance education programme and as a result, must be adopted by distance learners. At the same time, digital skills and access are instrumental in achieving digital library readiness. This study investigates the digital library readiness of distance learners in a large public multi-mode university in Ghana. The study adopts a survey design through the use of a questionnaire to ascertain the perspectives of distance learners on their computer and digital access and consequent digital and information skills and how this improves their perception of their digital library readiness. The population of the study consisted of 1,834 distance education students who were students of three distance education centres of a public university in Ghana. Stratified purposive sampling was applied to select three distance education centres and a total of 247, 276, and 118 distance learners from centres A, B, and C respectively to participate in the study. The results indicate that distance learners generally lacked advanced ICT skills to effectively use digital libraries. Furthermore, while most of the respondents indicated that they possessed above average ICT skills, this did not translate into skills in formation of search queries and the use of electronic library tools. However, their basic ICT skills constituted a solid ground to consolidate their digital library readiness. Libraries in multi-mode universities must design tailor-made training programmes for all classes of students including distance learners to enhance their use of digital library resources.

Keywords: Digital library readiness, distance learners, distance learning library services, information skills, digital literacy, universities

Introduction

The global economy of the twenty-first century requires organisations to enhance lifelong learning among their employees and ensure professional development and productivity (Plant et al., 2019). Distance learning opportunities have been offered by universities to primarily provide much-needed manpower skills to working professionals who have little or no option in leaving their jobs for full-time education (Kumar, 2018). Distance education provides a means for convergence in education, "connecting people who may be physically, socially, and/or culturally" separated from one another but whose purpose as engaged learners is demonstrated by their "mastery of a shared body of knowledge and common educational goals and aspirations" (Derlin and Erazo, 1997; Xiao, 2018). Higher education provided through distance education is valuable for the individual and also beneficial to the development of the economy and society in general. University education offered through distance education provides not only high-level skills required for the labour market but also the necessary competence for all kinds of professions in education, medicine, public service, engineering, the arts, among others (Kyllonen, 2012). These trained personnel develop the capacity and analytical skills that drive local or global economies (Mbewette, 2013).

The distance learner of the post-modern era is required to employ the use of numerous ubiquitous and open technologies (Arora & Babbar, 2013; Koomson, 2019). Thus distance learning metamorphosed into open distance education (ODE) employing diverse technologies and applications (Koneru, 2017). Some of these technologies, among others, include, learning management systems, open educational resources (OERSs), virtual learning and research management systems (VL/RMs), and Massive Open Online Systems (MOOCs) (Karplus, 2017;

Ochieng & Gyasi, 2021; Phungsuk et al., 2017; Tella et al., 2020). To enhance perpetual access and preservation of learning and knowledge objects prevalent in ODE, there emerged object repositories, institutional repositories, data repositories, and digital libraries (Adjei et al., 2019; Agosti et al., 2018; Santos-Hermosa et al., 2017). Among the latter group of technologies, digital libraries have the potential to incorporate all other preceding and pervasive technologies through several models for integrating digital libraries in distance education (Karplus, 2017; Owusu-Ansah et al., 2019). However, the ubiquity and prevalence of these techno-revolutionaries resulted in significant amounts of information being made available through online databases and other electronic information sources (De Medio et al., 2019). This proliferation is a double-edged sword, as it also poses significant skills challenges to users.

Recent studies in the African context point to little or ineffective use of digital library resources in distance education in support of teaching and learning (Larson and Owusu-Acheaw, 2016). Even though several factors may account for this (Owusu-Ansah et al., 2018), the purpose of this study was to investigate the extent to which digital library skills training of distance learners result in the use/non-use of the rich information resources. More specifically, the objectives of this study were to explore the (1) digital library skills possessed by distance learners; and (2) to determine the extent to which these skills contribute to distance learners' ability to use digital library resources.

Related literature

Ownership of and access to computing and networked devices are critical factors to enhance distance learners ability to deliver set targets and academic outcomes. After all, ownership of a personal computer has been found to predict higher readiness for computer-supported

collaborative learning (Khalifeh et al., 2020). Arthur-Nyarko and Kariuki (2019) found evidence to support the assertion that access to ICT devices, including personal computers, tablets, and smartphones, enhanced the learning environment among distance learners at the University of Cape Coast in Ghana. Their finding further suggested that due to, among others, the ownership of ICT devices, there was a higher anticipation for blended learning among the students. Sharma's (2019) survey of the perception of distance learners on the potential integration of mobile learning at the University of Jammu in India also indicated that 100% of the participants owned mobile devices. Aheto and Cronje's (2018) study of Ghanaian and South African Design students revealed the contrary of this expectation. They found that the participants were not digital-library ready with their digital handheld devices such as smartphones and tablets as they reported a low rating for for students' readiness to access libraries with their digital devices. They pointed out students' challenges with library portals being content-heavy and often not mobile-friendly. They recommended an adaptable library portal design with interactive design to enhance the use of digital libraries. Balogun et al. (2017) averred that individual considerations must be accorded individual users of information systems including access to and ownership of computers as these form learner infrastructural capabilities.

In the distance education context, digital library and information skills are required by stakeholders to obtain the requisite and relevant information resources required to achieve academic and research outcomes (Ofodu & Agim, 2017). The need for technological, digital, and information literacy skills and awareness are critical as they can enhance digital self-efficacy and result in the increased use of digital resources in distance education (Yu et al., 2017). Technology literacy and skills are required by users to interact with computers to create, locate,

search and use information in digital content (Kavulya, 2007). For distance learners, this is not only determined by their ability to use technologies but also by the need for human interaction and the need to be independent at finding resources (Brumfield, 2010). Ladell-Thomas (2012) supports this assertion by confirming that most distance learners lack ICT skills and there is a need to develop technology tools that enable them to independently learn to identify, access, evaluate, and use information resources. Together with related technology skills including mobile computing and learning skills, distance learners are empowered with technological skills to leverage digital library resources in distance education (Cross et al., 2016; Mshana, 2018; Sharma, 2019). In a similar vein, information literacy skills help users make effective and efficient use of the information and information services offered by the academic library (Mnkeni-Saurombe, 2014). Information literacy is now recognised by both educators and librarians in distance education as a critical success factor in teaching and learning (Moghaddam and Fard, 2014).

While it is worthwhile to establish the paramount role of ICT skills in acquiring digital library competencies, it is equally cardinal to examine the role of different demographics among digital library patrons from the perspective of their demographic characteristics. For instance, previous studies amplify the significant effect of generational differences on micro-blogging (e.g Twitter) adoption (Metallo & Agrifoglio, 2017); the factors determining smartphone addiction between younger and older users (Ahn & Jung, 2016); and child-parent transfer of digital guidance (Nelissen & Van den Bulck, 2018). This current study explores how these differences in the distance education context impact digital library competencies. Cantú-Ballesteros et al. (2017) explored the relationship between the digital skills of full-time teachers at the elementary school level and their socio-demographic factors including age and gender. Their study revealed that,

overall, there was no significant difference between age of the teachers and their digital skills which the authors noted to be at variance with the results of previous studies. However, the analysis found a significant difference between the age of teachers and their critical thinking and information management skills. This points to the fact that ICT skills relative to information management skills (including digital library skills) may be determined by the age of the user; the younger the user, the more efficient they are at using digital (library) tools and resources (Erasmus & Joubert, 2017; Juhaňák et al., 2019). Notwithstanding, Miwa et al. (2017) note that older students have a high potential to adapt to the use of computers in continuing education with the right instructional strategies and techniques. In respect to sex differences, While Aheto and Cronje (2018) found no statisitcally significant difference between male and female students in their preference for digital learning environments in South Africa and Ghana. Finally, Khalifeh et al. (2020) concluded in favour of male students having a higher aptitute for online learning compared to female students.

Previous studies identified the role of information literacy skills in enhancing the use of digital library resources in the distance education context. As digital library resources are ICT-based products, there is a need to understand the relationship between ICT and information literacy. Yu et al. (2017), in their study of the moderating effect of digital skills and information literacy in ICT adoption behaviour in a rural setting in Taiwan, reported of a moderating effect of information literacy and digital skills in ICT adoption behaviour. While emphasising the role of digital skills in adoption behaviour, their study found compelling evidence of information literacy potential to improve the self-efficacy of ICT patrons and reducing techno stress. In recognition of the critical role of lifelong learning skills as a critical outcome of distance

education, information literacy has been used to promote the use of relevant resources such as digital library services.

Methods

The context of this study is a large dual-mode, multi-campus public university in Ghana, the University of Education, Winneba. The University comprises the main campus (Winneba), three satellite campuses (Kumasi, Mampong and Ajumako) and 33 distance learning centres across the ten regions of Ghana (UEW Diary, 2017). It is one of the largest teacher education universities in Africa with a total student population of 57,000 (UEW Diary, 2017). As a result of its focus on teacher education, it employs distance education as a major strategy to upgrade and train both under-qualified and unqualified teachers. Teacher distance education at the undergraduate level in this University employs both print and electronic media. Distance learners at the University are required to attend tutorial sessions at the end of every month in their study centres with a course tutor. Printed course modules are supplied to distance education students to enable independent study. Physical tutoring of distance learners is supplemented with further online lessons on the moodle learning management system. The day-to-day administration of the centres is the responsibility of the centre coordinator who ensures that essential support services such as library services are provided to students (University of Education, Winneba Website, 2017).

This research was conducted with the use of a survey design. The population of the study consists of 1,834 distance education students who were students of three distance education centres of the University of Education, Winneba. In addition, the population consisted of 30 distance education tutors each from the three centres. Finally, the population included the Head

of the Centre for Distance Education and three coordinators from the three distance education centres. Stratified purposive sampling was an important first step in fulfilling the study objectives and this was achieved by purposively sampling three distance education centres where there were academic library services. These centres are located in Winneba, Kumasi and Asante-Mampong. These centres are incidentally the location of three out of four campuses of the University of Education, Winneba. The sample size of the student population was determined by applying the 95 percent confidence level at a 5 percent confidence interval to each of the sub-groups in the student population.

Table 1: Population of the study

Distance study centre	Distance education students	
	Population	Sample size
Winneba	692	247
Kumasi (UEW)	973	276
Mampong	169	118
Sub-Totals	**1,834**	**641**

Source: UEW Basic Statistics, 2016

A questionnaire instrument was used for the study. There were, however, two kinds of questionnaires; one fully structured questionnaire for distance learners, and two semi-structured questionnaires for distance education tutors and coordinators respectively. The questionnaire instrument was administered for a period of four months specifically from the month of March to June 2016. The researcher personally administered the questionnaire for the Kumasi centre which was located on the Kumasi campus of the University. Regarding the two other centres, colleagues who were staff of libraries in the two other campuses namely, Asante-Mampong and Winneba, assisted the researcher in administering the questionnaire.

Data analysis was completed with the version 21 of the Statistical Package for the Social Sciences (SPSS). Univariate and bivariate analysis was conducted to establish relationships among the variables of the study. Data was presented through graphs (bar charts, histograms and pictograms), and frequency distributions. Again, the use of cross-tabulation and descriptive statistics combined to establish distance learners' and tutors' attitudes and perceptions towards digital library resources.

Results

Participants

Distance learners were the primary population of the study. Their responses on digital libraries formed the basis of much of the findings of the study. From a sample population of 641 distance learners spread across the three centres namely, Winneba (247), Kumasi (276) and Asante-Mampong (118), a total of 453 distance learners completed the questionnaire, yielding a response rate of 70.67%. Table 2 outlines the distribution of the centres and the distance learners who participated in the study:

Table 2: Distance education centres and population of sampled distance learners

Centre	Gender		Total
	Male	Female	
Winneba	76	119	195
	38.0%	47.0%	43.0%
Kumasi	78	103	181
	39.2%	40.7%	40.0%
Asante-Mampong	46	31	77
	23.1%	12.3%	17.0%
Total	200	253	453
	44.2%	55.8%	100.0%

Source: Field data, 2016

Table 2 presents the total participants of distance learners in the study according to their centres. The distribution of distance learners among these three centres demonstrates that the majority (n=195, 43%) of the participants were from the Winneba centre, whereas 181 (40%) of the learners were located at the Kumasi study centre. Meanwhile, 77 (17%) of the learners were drawn from the Asante-Mampong centre. The results suggest that the participation of distance learners in the study was higher at the Winneba study centre than in the other two centres.

In addition, the population consisted of 162 distance education academics (tutors), four coordinators (includes the Head of the Centre for Distance Education and three centre coordinators).

Age and gender of distance learners

Distance learners who participated in the study were expected to indicate their gender and age. Table 3 presents the gender and age of distance learners who participated in the study:

Table 3: Gender and age distribution of distance learners

	Age group				
Gender	21 - 30 yrs.	31 - 40 yrs.	41 - 50 yrs.	51 - 60 yrs.	Total.
Male	106	61	29	3	199
	40.5%	43.3%	67.4%	42.9%	43.9%
Female	156	80	14	4	254
	59.5%	56.7%	32.6%	57.1%	56.1%
Total	262	141	43	7	453
	57.8%	31.1%	9.5%	1.5%	100.0%

Source: Field survey, 2016

Table 3 presents a cross-tabulation of the gender and age distribution of the respondents. The results indicate that the females dominated in the study as more than half (n=254, 56.1%) of the learners were females compared to 199 (43.9%) who were males. The results indicate that there was more female participation than there were males participated in the study. This result suggests that women did not have equal opportunities of undertaking full-time studies like their male counterparts probably because of their role in procreation and also attending to family duties.

In relation to the age of distance learners, the study also found that the majority (n=262, 57.8%) of the respondents were aged between 21 to 30 years. However, of this age group, there were more females undertaking distance study (n=156, 59.2%) than males (n=106, 40.5%). This can be explained in several ways. The majority of women in this age group opt for distance education due to the flexibility it offers them in their most productive stage of life. Meanwhile,

one-third (n=141, 31.1%) of the respondents indicated they were aged from 31 to 40 years. The least represented age group is the 51-60-year-olds who comprise just 1.5%, an indication that even though distance education is preferred by adults, the demanding nature of distance study may be a disincentive to older adults. It is, therefore, important that this negative perception of distance education as heavily demanding is alleviated with support services such as effective library support in the form of digital library services.

Access to and skills in digital technology

Access to computer devices is a major critical success factor for the use of digital libraries. Distance learners in this study were asked to indicate their own or otherwise of a personal computer. The responses in Table 4 below describe a number of learners on the distance learning programme who owns personal computers.

Table 4: Ownership of a personal computer/laptop

Response	**Freq. (n)**	**Percentage (%)**
Yes	270	59.6
No	139	30.7
No response	44	9.7
Total	453	100.0

Source: Field survey, 2016

From the results, it can be observed that more than half (n=270, 59.6%) of the learners responded 'Yes' to having personal computers whereas 139 (30.7%) of the learners, on the other hand, stated they do not have their computers. The results imply that most learners on the distance learning programme have their personal computers and hence might not be encouraged to go to campus to access resources at the digital library if the learner could have internet resources available on their personal computers remotely.

Access to networked devices

To access electronic resources, distance learners need access to a networked device. Table 5 below shows distance learners' ownership of networked computers.

Table 5: Access to a networked device

Response	Freq. (n)	Percentage (%)
Yes	165	40.0
No	248	54.7
No response	40	8.8
Total	453	100.0

Source: Field survey, 2016

The responses show that more than half (n=248, 54.7%) of the learners do not have access to networked computers. However, 165 (40%) of the learners maintained they have access to networked computers. The outcome of the responses suggests that learners on the distance learning programme do not have access to networked computers through which they could access electronic resources.

Where distance learners access networked computers

Distance learners were also asked to indicate where they access networked computers for which a summary of their responses is being shown in Table 6:

Table 6: Access to networked computers

	Freq. (n)	Percent (%)	Valid Percent (%)	Cumulative Percent (%)
At my Centre	51	11.3	21.7	21.7
At home	163	36.0	69.4	91.1
Others	21	4.6	8.9	100.0
Total	235	51.9	100.0	
No Response	218	48.1		
Total	453	100.0		

Source: Field survey, 2016

As a follow-up, learners were asked to indicate where they have access to networked computers. The responses in Table 6.22 indicates that more than half (n=163, 69.4%) of the learners who have access to the networked computers stated they do have access to the network at home. Meanwhile, 51 representing 21.7% of the valid responses stated they have access at their respective centres. From the responses, it could be concluded that learners on the distance learning programme mostly access networked computers from their homes.

Level of schooling where learner learned to use a computer

Showing in the figure below relates to the various levels of education at which learners learned to use computers.

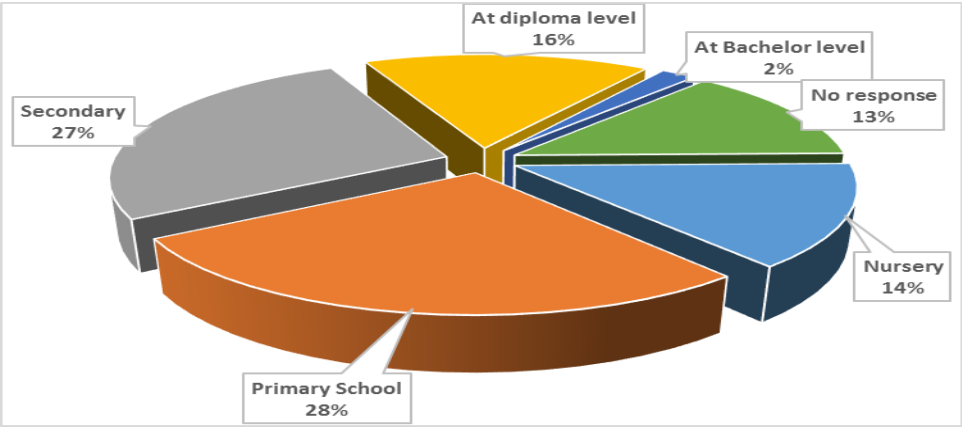

Figure 1: Level of schooling where learner learned to use a computer

From figure 1, it could be observed that the majority (28%) of the learners learned to use computers at the primary school level whereas 28% of the learners also pointed out that they learned to use the device at the Secondary school level whereas 16% also learned at the diploma level. The results imply that learners on average have had long experiences with the use of computers, but the question is how this experience translates into the use of digital library resources.

Learners' experience with computer usage

One other factor that can affect learners' attitude towards the use of digital libraries is their experience with the use of computers. Table 7 presents the results thereof:

Table 7: Experience in computer usage

	Freq. (n)	Percent (%)
Less than 1 years	87	19.2
1 - 2 years	97	21.4
3 - 4 years	80	17.7
Above 4 years	146	32.2
No response	43	9.5
Total	453	100.0

Source: Field survey, 2016

In terms of experience with computer usage, the results show that the majority (n=146, 32.2%) of the learners had had more than 4 years of computer usage. Furthermore, 97 (21.4%) of the learners pointed out they have had 1 – 2 years of computer usage whereas 87 (19.2%) of the learners also noted they had had less than a year of computer usage. The outcome of the responses gives the impression that learners, to say the least, have had an appreciable number of years of experience with computer usage enough to be able to access digital library resources confidently.

Learners' computer competencies

Learners' competency with computers is an indicator of what they can do or not do with the computer. Learners' competencies with the computer are shown in Table 6.24 below:

Table 8: Number of computer skills/packages of respondents

Skills	Mean	Freq. (n)
Internet use	3.05	205
Word processing	3.11	196
Spreadsheet	3.38	162
Powerpoint presentation	3.41	153
Computer repair and maintenance	4.01	69
Web page design	4.03	65

Kendall's W^a=0.118, $\chi 2$=(5)252.260, p<.05

From Kendall's mean ranking of the number of computer skills possessed by learners, Table 8 shows that the use of the Internet with a mean of (m=3.05) came up as the skill possessed by the majority of distance learners hence ranked first. A mean of (m=3.11, n=196) showed Word processing as the second skills mostly possessed by the learners whereas the third skill competence evidenced by learners was the spreadsheet with (m=3.38, n=162). On the contrary, web page design with a mean of (m=4.03, n=65) showed up as the least computer skills possessed by the learners.

That notwithstanding, Kendall's coefficient of concordance statistics shows that there was a statistically significant degree of agreement among the learners, however, the degree of agreement was found to be relatively low with (W^a=0.118, $\chi 2$=(5)252.260, P<.05). From the results, it can be concluded that learners on the distance learning programmes are good when in terms of internet applications as well as word processing mainly since learners constantly use the internet to gather information for their research and assignments and then use the word processing applications to organize the information in a more presentable manner for submission.

How distance learners acquired digital library skills

Learning a new skill can be challenging especially with electronic resources, hence learners were asked to indicate how they learned to use digital resources. Responses are presented in Table 9.

Table 9: Method for learning to use digital library resources

Variable	Response	
	Freq. (n)	Percentage (%)
Trial and error	82	18.1
Guidance from other students	144	31.8
Guidance from library staff	45	9.9
Self-taught	40	8.8
Course offered by the university	51	11.3
Guidance from computing staff	61	13.5
External courses	7	1.5
Guidance from IT technician	8	1.8
No response	15	3.3
Total	453	100.0

Source: Field survey 2016

Learners responding to how they learned to use digital library resources showed that the majority (n=144, 31.8%) of them learned to use the resources through the guidance of their friends. In addition, 82 (18.1%) of the respondents also indicated that they did so by the "trial and error" approach whereas 61 (13.5%) of the learners insisted they learned to use the resources through the guidance they received from the computer staff at their respective study centres. The results indicate that most of the students learned to use digital library resources through the assistance they received from friends.

Perception of distance learners on their level of information skills

Respondents were also asked to rate their level of information skills. The results of this question are presented in Figure 2.

Figure 2: Distance learners' perception of their level of information skills

Source: Field survey 2016

Figure 2 depicts distance learners' assessment of their level of information skills. From the results, it could be observed that the majority (n=180) of the learners indicated that they have 'Good' skills. Meanwhile, 132 learners stated they perceive their level to be 'Fair', whereas 74 reported being poor in terms of their information skills.

Digital skills of distance learners

As part of the assessment, learners were also asked to evaluate their digital skills against a series of statements concerning their knowledge and use of specific digital tools. The findings are presented in Table 10.

Table 10: Digital skills set of distance learners

Variable	Response					
	Agree		Disagree		No response	
	Freq. (n)	%	Freq. (n)	%	Freq. (n)	%
I am skilled in the use of computers	303	66.9	97	21.4	53	11.7
I am skilled in the knowledge of database structures	152	33.6	233	51.4	68	15.0
I am skilled in formulating search queries	137	30.2	247	54.5	69	15.2
I am skilled in online navigation techniques	153	33.8	224	49.4	76	16.8
I am skilled in the use of electronic library tools	122	26.9	257	56.7	74	16.3
I am conversant with electronic formats e.g. PDF, JPEG, MPEG, etc.	114	25.2	266	58.7	73	16.1

Source: Field survey 2016

Responses regarding distance learners' skills in the use of computers show that more than half (n=303, 66.9%) of the learners are skilled in the use of the computer, whereas 97 (21.4%) of the learners observed that they were not skilled in the use of computers.

Regarding knowledge of database structures, just about half (n=233, 51.4%) of the learners said that they were not skilled in the knowledge of database structures, but 152, comprising 33.6% of the learners intimated that they are skilled in database structures. Furthermore, the results also show that about half (n=247, 54.5%) of the learners observed that they are not skilled in formulating search queries, whereas 137, constituting 30.2% of the learners said they were.

More so, it could also be observed from Table 6 that nearly half (n=224, 49.4%) of the learners said that they were not skilled in online navigation techniques. Meanwhile, 153 (33.8%) of the learners, however, are skilled in online navigation techniques.

Again, questions relating to distance learners' skills in the use of electronic library tools showed that more than half (n=257, 56.7%) of the learners disagreed they are skilled at using electronic library tools, while 122 (26.9%) of the learners, on the contrary, agreed that they were skilled in the use of electronic library tools.

Moreover, the results showed that 266 (58.7%) of the respondents observed that they were not conversant with electronic formats. On the contrary, 114 (25.2%) of the learners also agreed that they are conversant with electronic formats such as PDFS, JPEG, MPEG, among others.

To understand further, the views of students on their level of ICT skills, coordinators were also asked for their views. Most of the distance education coordinators were not very convinced that distance learners were very competent. One of the coordinators said that "students are unable to

search for information on the Internet without assistance". Another also pointed out that some of them are even using computers for the first time despite their previous higher educational experience.

From the results, it can be concluded that in terms of distance learners' level of competence as far as ICT is concerned, most of them are competent in basic computer applications. In terms of specific computer applications such as database structures, formulating search queries, navigating techniques online, electronic library tools, and to some extent electronic formats, however, they do not have adequate knowledge.

Discussion

Distance learners' access to and skills in digital technology

From the point of view of distance education stakeholders, technological infrastructure centred on distance learners' ownership of personal computers and access to networked computers. The findings revealed that most distance learners (59.6%) have access to personal computers whereas 30.7% do not have access. A few distance learners (9.7%), however, chose not to divulge information on their ownership of personal computers. Again, this result is akin to Liebenberg et al. (2012) who found that distance learners who were not active online (46%) lacked access to computers. The researchers explain that this situation may lead to non-owners of computers to seek to use computers for information access from elsewhere including Internet cafés where they are most likely to access poor quality information. This, therefore, requires distance education providers to commit to increasing funding for computers that can provide access to digital library resources. Nkomo et al. (2011) express similar sentiments that without adequate computers, the use of digital libraries may be hampered.

In respect of ownership of networked computers, the results of the students' survey indicate that more than half of the respondents (54.7%) did not have networked computers, a finding which suggests that, of those who own personal computers, more than half of them may not use their devices to access digital library resources. This figure translates to a fourth of all distance learners who have computers that are capable of accessing digital library resources. This finding mirrors the findings of Oladokun (2010) who found in his study that just a quarter of distance learners in two satellite campuses in Botswana had access to the Internet.

In terms of popular locations for accessing networked computers, the study found that most distance learners accessed networked computers from their homes (36%). Also, 11.3% reported accessing it in their centres, with a few of them (4.6%) pointing to "other" places, whereas 48.1% failed to indicate where they had access. This was rather, a high number for those who were undecided in where they usually accessed networked computers. The phenomenon of home access to the Internet appears to be on the ascendancy. Liebenberg et al. (2012) confirm this notion in their study where they found that most distance learners who participated in online learning accessed networked computers from home (57%) and work (51%). Distance learners who did not participate in online learning, rather, accessed networked computers from Internet cafés (34%), and with others accessing it from Unisa computer laboratories (25%). Institutional computer laboratories and libraries are high, convenient places for students who lack personal access to computers or the Internet. Without adequate networked computer terminals in these venues, however, distance learners may decide to use "other" available places such as commercial Internet service providers (ISPs) where they are most likely to access sub-standard digital resources. This will also increase the cost of their information seeking as they have to pay

for additional charges when they visit ISPs, and affordability may dissuade them from seeking digital information, altogether. Juxtaposed to the number of computers in the various centre libraries, it is obvious that the number of networked computers in these centres are inadequate. Finally, taking into cognisance the high number of distance learners who were undecided in where they access networked computers, it may be suggested that they rarely access networked computers, since access to digital information are not requirements in their courses anyway.

Digital library users require appropriate knowledge, and experiences with technology (hard skills), and good information skills (soft), to be able to exploit digital library resources. The findings revealed that most distance learners had long experiences with the use of computers with 28% indicating they learned to use a computer at the primary and secondary education levels respectively. Because most of the distance learners are people born after the introduction of the computer, most of them may have been introduced to computers at an earlier stage in their education. In addition, 16% indicated that they only learned to use computers at the diploma level, that is, during their first spell in the University of Education, Winneba when they were pursuing their Diploma in Basic Education. This finding is, rather, a departure from Gakibayo, Ikoja-Odongo and Okello-Obura (2013), who found that most students learned to use computers at the university. Notwithstanding, findings in this study suggest that distance learners are confident in their computer skills.

Furthermore, distance learners' actual length of computer experience were also investigated. The findings showed that most of them (32.2%) had at least four years of computer experience which buttresses the previous finding on their self-reported experience with computers. This finding is, however, at odds with other researchers such as (Khan et al., 2011) who found that most of the

students in their study were beginners in terms of their computer experience (46%), with a significant number declaring that they had between two to three years (38%) of computer experience, while those with four to five years (11%) were a handful. The findings in this study are suggestive of the fact that distance learners have considerable experience with computer technologies.

Acquiring knowledge of computer and software applications are critical success factors in 21st-century university education (Gakibayo et al., 2013). In terms of distance learners' experiences with particular computer applications, the findings were not unexpected. Among these are the fact that Internet searching (Mean=3.05) was indicated by most distance learners as the computer application they were most proficient in. 196 of them also indicated Word processing (Mean=3.11) as the next application they were skilled in, while another significant set pointed to their experience in Spreadsheet (Mean=3.38), as well as, PowerPoint presentation (Mean=3.41). These are common computer applications that help students and teachers to complete various academic tasks such as, typing research or assignments, creating a grading book or making a classroom presentation. These are therefore also referred to as productivity software (Scheeren, 2010:61). The findings in this study closely reflect that of Gakibayo et al. (2013), who found that most of the respondents in their study were proficient in Word processing (75.1%), Internet searching (60.1%), but with lower ratings for advanced computer skills like database management (27.4%), and programming (21%). Unlike in Gakibayo et al., however, Internet searching skills in this study received the highest rating; while in this study, advanced computer skills such as computer repair and maintenance, and Web design received relatively lower ratings with means of 4.01 and 4.03 respectively. Mac Callum and Jeffrey (2013) describe three types of ICT skills namely basic ICT skills, advanced ICT skills and advanced mobile skills. In their

study, they found that students who were competent basic ICT users were more likely to adopt advanced ICT applications. It is, therefore, suggested that, even though most distance learners in this study are not familiar with digital library resources available in their centre libraries, they may be able to exploit digital library resources if they are given the needed training and exposure to existing digital library resources.

Another important finding of the study relates to how distance learners' learned to use digital library resources. The findings revealed that most of them learned to use digital library resources through the guidance of colleague students (31.8%), while another 18.1% of them indicated learning through "trial and error". In addition, 61 (13.5%) students reported receiving guidance from computer staff, while another 51 (11.3%) admitted learning through a course offered by the University. It is instructive to note that only 45 (9.9%) students had their training with the library, while another 40 (8.8%) pointed out that they learned on their own. These findings reflect the literature which points out that colleague students are sources of information to distance learners (Chawinga and Zozie, 2016).

Similarly, Gakibayo et al. (2013) also discovered that many students found out about electronic resources through their colleagues (54.1%) than through any other source including the library or workshops. (Khan et al., 2011) also report that most students in their study learned to use the computer through their efforts (51%). These findings suggest that students do not consider institutional or formal training as the preferred source of training in ICT skills. Relying on friends, however, to obtain competence may not be good enough for successful information seeking. Oladokun (2010) believes that for successful competence to complete information seeking, formal training is a better option. Yan et al. (2017) propose that the self-efficacy of

students in information seeking may be improved through the vicarious experiences of information seekers with higher self-efficacy. This happens through formal training where knowledgeable people such as librarians and ICT experts teach information retrieval or Internet searching skills. It is, therefore, suggested that formal training programmes be organised regularly for distance learners to improve their basic ICT skills to enhance their ability to exploit digital library resources.

Perception of distance learners on their digital library readiness

The study also focused on assessing distance learners' perceptions of their digital and information skills as a way of determing their digital library readiness. In response, most of them (n=180) indicated that their skills were "Good", whereas 132 indicated their skills were "Fair". Meanwhile, 74 of them were of the view that their skills were poor. Interestingly, only 28 of the respondents were confident that they had superior-excellent information skills. These responses re-echo previous findings that suggest that distance learners have relatively high confidence in their ICT skills. Baro and Keboh (2012) opine that computer literacy is a prerequisite for information literacy. Consequently, it may be understood why distance learners in the study believed they have good information skills.

To ascertain the claims made by distance learners on their information skills, another question was put to distance learners to understand their specific competencies. The findings suggest that among a list of information tasks, distance learners indicated their highest skills in the use of the computer (66.9%), with skills in online navigation being second (33.8%). While these skills are important, the low rating for skills in the formation of search queries (30.2%), and the use of electronic library tools (26.9%) are problematic. Searching skills, awareness, and the use of

appropriate information resources are very critical for the information search process. This finding is consistent with (Ng, 2013) who found that 52% of distance learners stated that searching skills are a challenge during their information searching. Ng (2013), however, attributed this challenge to possibly lack of awareness of relevant information resources on the part of distance learners. It is, therefore, imperative that to improve the information skills of distance learners, they are also made aware of the resources that they have to use to sharpen their skills to search for information.

Conclusion

The study concludes that distance learners generally lacked advanced ICT skills to effectively use digital libraries. They have basic ICT skills which were self-taught or taught by colleagues and to some extent the university ICT centre. This training, however, does not include important Internet skills such as database searching and information retrieval skills. Again, most distance learners prefer to access digital information from other places such as their homes and workplaces, and free Internet resources, from outside the library. It is, therefore, suggested that the libraries in the centres should design training programmes for distance education students to enable them to access digital library resources independently when they are not in their centres. This training must be planned collaboratively with distance education stakeholders, after a needs assessment, since distance learners may have specialised information needs unknown to librarians.

The provision of skills and training go hand in hand with the effective use of technological tools. Through an effective needs assessment programme, digital library managers must design training programmes for users in distance education. In recognition of the fact that most distance learners

have basic ICT skills, it is quite convenient to consolidate this initial knowledge to train them in the use of digital resources. These training programmes may take the form of information literacy courses or training in specific digital resources. These training programmes may also be replicated in online tutorials and guides to facilitate independent learning. For students, it will be useful to demonstrate how digital library resources can be used in their learning and research activities.

In addition to distance learners, skills training must be extended to other distance education stakeholders such as tutors and coordinators (administrators). These stakeholders must be involved in the planning of the training programmes for both students and themselves. For distance education stakeholders, they must be provided with an open door policy where they can contact any library staff when they encounter any challenge in using any library resource. To enhance this process, any library staff involved in training them should initiate an ongoing relationship with distance education stakeholders by providing a means of personal contacts.

It is also recommended that in terms of technology and information skills training to enhance digital library use in distance education in universities, two methods namely, digital resource-specific training and information literacy training be offered to both students and distance education teaching staff and coordinators on the one hand; and general ICT training organised occasionally in conjunction with ICT staff or external resource persons on the other.

References

Aheto, S.-P. K., & Cronje, J. (2018). Digital device ownership and learning environment preferences of students in South Africa and Ghana. *Turkish Online Journal of Distance Education*, *19*(3), 93–111.

Ahn, J., & Jung, Y. (2016). The common sense of dependence on smartphone: A comparison between digital natives and digital immigrants. *New Media & Society*, *18*(7), 1236–1256.

Arora, S. K., & Babbar, P. (2013). *ODL support services through use of innovation and technology: A case study of Indira Gandhi National Open University library*.

Arthur-Nyarko, E., & Kariuki, M. G. (2019). Learner Access to Resources for eLearning and Preference for Elearning Delivery Mode in Distance Education Programs in Ghana. *International Journal of Educational Technology*, *6*(2), 1–8.

Balogun, N. A., Mejabi, O. V., & Bello, O. W. (2017). Introducing learner infrastructural capabilities into information systems success model using E-learning. *University of Sindh Journal of Information and Communication Technology*, *1*(1), 8–16.

Baro, E. E., & Keboh, T. (2012). Teaching and Fostering Information Literacy Programmes: A Survey of Five University Libraries in Africa. *The Journal of Academic Librarianship*, *38*(5), 311–315. https://doi.org/10.1016/j.acalib.2012.07.001

Brumfield, E. J. 2010. Applying the critical theory of library technology to distance library services. *Journal of Library & Information Services in Distance Learning*, *4*(1-2): 63–71.

Cantú-Ballesteros, L., Urías-Murrieta, M., Figueroa-Rodríguez, S., & Salazar-Lugo, G. M. (2017). Teacher's Digital Skills in Relation to Their Age, Gender, Time of Usage and Training with a Tablet. *Journal of Education and Training Studies*, *5*(5), 46–57.

Chawinga, W. D., & Zozie, P. 2016. Information needs and barriers to information sources by open and distance learners: A case of Mzuzu University, Malawi. *SA Journal of Information Management*, *18*(1): 12–pages.

Cross, S., Sharples, M., & Healing, G. (2016). *Learning with mobile devices: The changing place and space of distance learners' study*.

Derlin, R. L., & Erazo, E. 1997. Distance learning and the digital library: Transforming the library into an information centre. *New Directions for Teaching & Learning*, 71: 103.

Erasmus, B. J., & Joubert, J. P. R. (2017). Information and communication technology skills in higher education; the case of a distance learning institution. *Journal of Contemporary Management*, *14*(1), 1010–1034.

Gakibayo, A., Ikoja-Odongo, R., & Okello-Obura, C. (2013).. electronic information resources utilizationn by students in Mbarara University Library. *Library Philosophy and Practice (E-Journal)*, *869.*

Juhaňák, L., Zounek, J., Zaleska, K., Bárta, O., & Vlčková, K. (2019). The relationship between the age at first computer use and students' perceived competence and autonomy in ICT usage: A mediation analysis. *Computers & Education*, *141*, 103614.

Khalifeh, G., Noroozi, O., Farrokhnia, M., & Talaee, E. (2020). Higher education students' perceived readiness for computer-supported collaborative learning. *Multimodal Technologies and Interaction*, *4*(2), 11.

Khan, S. A., Khan, A. A., & Bhatti, R. 2011. Internet Access, Use and Gratification among University Students: A Case Study of the Islamia University of Bahawalpur, Pakistan. *Chinese Librarianship*, (32): 1–14.

Kavulya, J.M. 2007. Digital libraries and development in Sub-Sahara Africa. *The Electronic Library. 25*(3): 299-315.

Karplus, S. S. (2017). Integrating academic library resources and learning management systems: The library Blackboard site. *Education Libraries*, *29*(1), 5–11.

Khan, S. A., Khan, A. A., & Bhatti, R. (2011). Internet Access, Use and Gratification among University Students: A Case Study of the Islamia University of Bahawalpur, Pakistan. *Chinese Librarianship*, *32*, 1–14.

Koomson, W. K. (2019). Ontology of Ubiquitous Learning: WhatsApp Messenger Competes Successfully with Learning Management Systems (LMS) in Ghana. *International Association for Development of the Information Society*.

Kumar, B. A. (2018). *Issues and Challenges for Skill Development of Distance Learners through ODL System*.

Kyllonen, P.C. 2012. The importance of higher education and the role of no cognitive attributes in college success. Education Testing Service, Rosedale Road, Princeton, NJ, USA 08541. Available at: http://www.pensamientoeducative.org (accessed 25 October 2014).

Ladell-Thomas, J. 2012. Do-It-Yourself information literacy: Self-Directed Learning at a distance. *Journal of Library & Information Services in Distance Learning*, *6*(3-4): 376–386.

Larson, A. G., & Owusu-Acheaw, M. 2016. Information needs of distance learners: A case of Winneba Study Center, University of Education, Winneba, Ghana. *Turkish Online Journal of Distance Education*, *17*(3): 62–75.

Liebenberg, H., Chetty, Y., & Prinsloo, P. 2012. Student access to and skills in using technology in an open and distance learning context. *The International Review of Research in Open and Distributed Learning*, *13*(4): 250–268.

Mac Callum, K., & Jeffrey, L. (2013). The Influence of Students' ICT Skill and their Adoption of Mobile Learning. *Australasian Journal of Educational Technology*, *29*(3), 303–314. https://doi.org/10.1234/ajet.v29i3.298

Mbwette, T. S. A. 2013. The role of open and distance learning in widening access to university education. Keynote speech. Oxford Summit of Leaders "Science and Technology", 16th-19th December, 2013, Oxford, UK.

Metallo, C., & Agrifoglio, R. (2015). The effects of generational differences on use continuance of Twitter: An investigation of digital natives and digital immigrants. *Behaviour & Information Technology*, *34*(9), 869–881.

De Medio, C., Limongelli, C., Marani, A., & Taibi, D. (2019). Retrieval of educational resources from the web: A comparison between google and online educational repositories. *International Conference on Web-Based Learning*, 28–38.

Miwa, M., Nishina, E., Kurosu, M., Takahashi, H., Yaginuma, Y., Hirose, Y., & Akimitsu, T. (2017). Changing patterns of perceived ICT skill levels of elderly learners in a digital literacy training course. *LIBRES: Library and Information Science Research Electronic Journal*, *27*(1), 13–25.

Mnkeni-Suarombe, N. 2014. IL: A cornerstone for Open Distance Learning at the University of South Africa. *Journal of Librarianship and Information Science*. 1 –10.

Moghaddam, H.S. & Fard, E.M. 2014. information literacy in distance education universities in Iran: a case study of Payame Noor University. *International Journal of Information Science & Management*, *12*(1): 65–75.

Mshana, J. A. (2018). Effectiveness of Mobile Learning as a means of Distance Learning in Tanzania. *Huria: Journal of the Open University of Tanzania*, *25*(1), 209–232.

Nelissen, S., & Van den Bulck, J. (2018). When digital natives instruct digital immigrants: Active guidance of parental media use by children and conflict in the family. *Information, Communication & Society*, *21*(3), 375–387.

Ng, S. N. (2013). *Finding my way around: The information process of distance students when searching for free online resources*. 1–12.

Niu, X., Hemminger, B. M., Lown, C., Adams, S., Brown, C., Level, A., Cataldo, T. 2010. National study of information-seeking behaviour of academic researchers in the United States. *Journal of the American Society for Information Science and Technology*, *61*(5): 869–890.

Nkomo, N., Ocholla, D., & Jacobs, D. 2011. Web information-seeking behaviour of students and staff in rural and urban based universities in South Africa: a comparison analysis. *Libri: International Journal of Libraries & Information Services*, *61*(4): 281–297.

Ofodu, P. N., & Agim, O. A. (2017). The place of library and information services in open and distance learning in Nigerian universities. *Library Philosophy and Practice (e-Journal), 1642*.

Oladokun, O. (2010). A Comparison of the information-seeking pattern of distance learners in Botswana: a case study of four tertiary institutions. *Journal of Library & Information Services in Distance Learning*, *4*(3): 119–136.

Owusu-Ansah, C. M., Rodrigues, A.., & Van Der Walt, T. B. (2019). Integrating Digital Libraries into Distance Education: A Review of Models, Roles, and Strategies. *Turkish Online Journal of Distance Education*, *20*(2), 89–104.

Owusu-Ansah, C. M., Rodrigues, A., & Van Der Walt, T. B. (2018). Factors Influencing the Use of Digital Libraries in Distance Education in Ghana. *Libri*, *68*(2), 125–135.

Plant, K., Barac, K., & Sarens, G. (2019). Preparing work-ready graduates–skills development lessons learnt from internal audit practice. *Journal of Accounting Education*, *48*, 33–47.

Phungsuk, R., Viriyavejakul, C., & Ratanaolarn, T. (2017). Development of a problem-based learning model via a virtual learning environment. *Kasetsart Journal of Social Sciences*, *38*(3), 297–306.

Santos-Hermosa, G., Ferran-Ferrer, N., & Abadal, E. (2017). Repositories of open educational resources: An assessment of reuse and educational aspects. *International Review of Research in Open and Distributed Learning: IRRODL*, *18*(5), 84–120.

Sharma, D. (2019). *Exploring the Potential of Mobile Learning in Distance Higher Education: A Case Study of the University of Jammu, Jammu, and Kashmir*.

Xiao, J. (2018). On the margins or at the center? Distance education in higher education. *Distance Education*, *39*(2), 259–274.

Yan, Y., Zha, D., Yan, A., & Zhang, Q. (2015). Exploring the effect of individual differences on self-efficacy in getting information. *Information Development*, 0266666915588795. https://doi.org/10.1177/0266666915588795

Yu, T.-K. (2017). Understanding factors influencing information communication technology adoption behavior: The moderators of information literacy and digital skills. *Computers in Human Behavior*, 13.